

(12) **UK Patent Application** (19) **GB** (11) **2 286 111** (13) **A**

(43) Date of A Publication 09.08.1995

(21) Application No 9425213.7

(22) Date of Filing 14.12.1994

(30) Priority Data

(31) 9325566 (32) 14.12.1993 (33) GB

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(51) INT CL⁶

A47J 37/06

(52) UK CL (Edition N)

A4D D10B1

(56) Documents Cited

WO 81/03270 A1 BR 006701598 A

(58) Field of Search

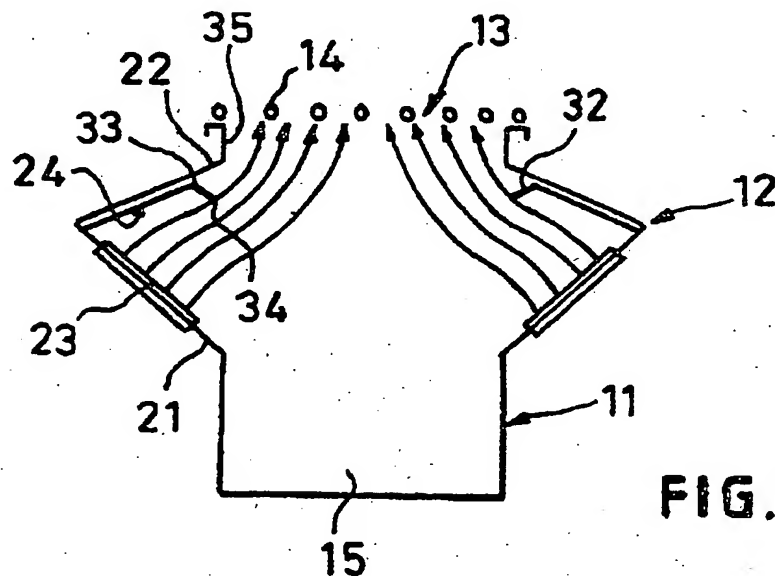
UK CL (Edition N) A4D D10B1 D3 D9A

INT CL⁶ A47J 37/06 37/07

Online: WPI

(54) Grill

(57) The grill comprises a rectangular chamber 11 with a triangular side extension 12 on each of two opposite sides and an open top 13 covered with a grid 14 for food to be cooked, with the base of the chamber forming a water reservoir 15. In each side extension a radiant device 23 is mounted to direct its heat upwardly towards the grid. The heater does not extend below the grid and so liquids or pieces of food passing through the grid do not fall onto it. Reflectors 24 reflect the heat in the direction of the grid. The adjustable bent portion 32, 34 of each reflector ensuring that the heat is applied uniformly across the width of the grid by the heating means on both sides of the chamber. The grid may be replaced by a spit, kebab skewer frame and/or vertical grill. The heaters are provided with liquid fuel such as butane.



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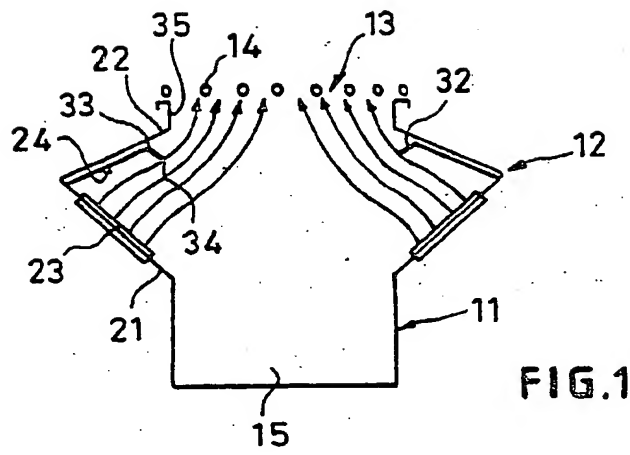


FIG. 1

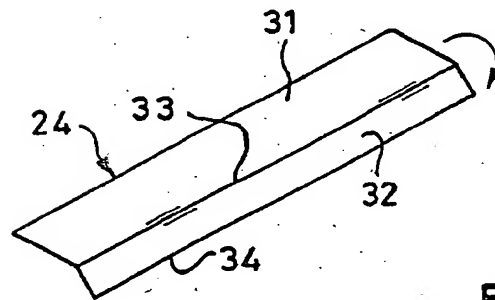


FIG. 2

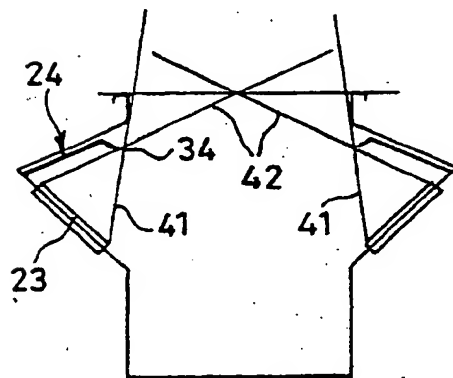
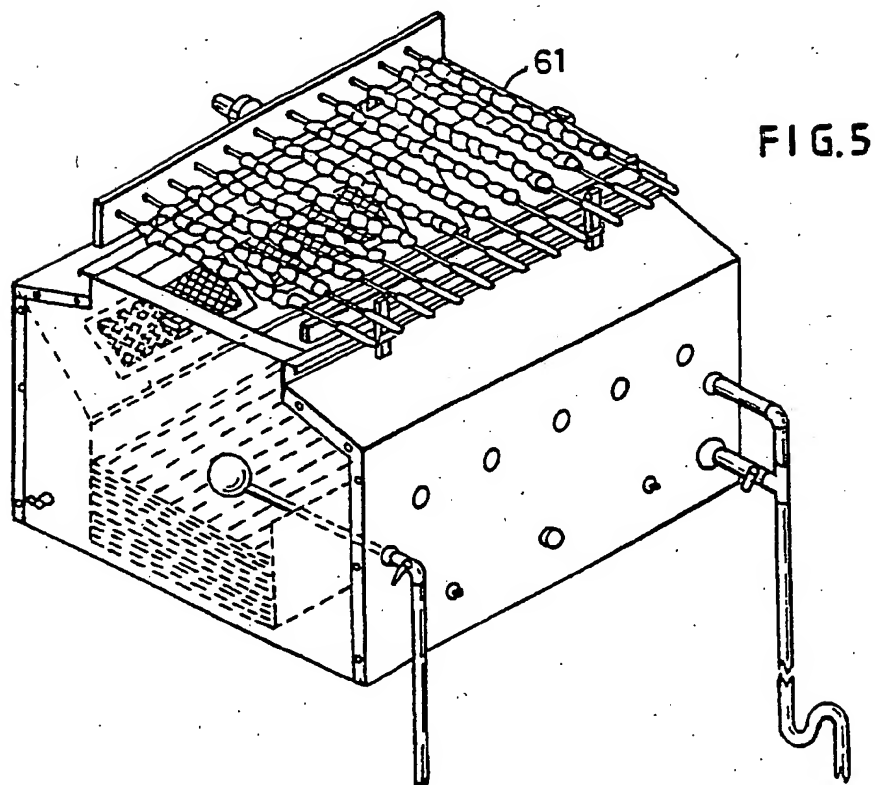
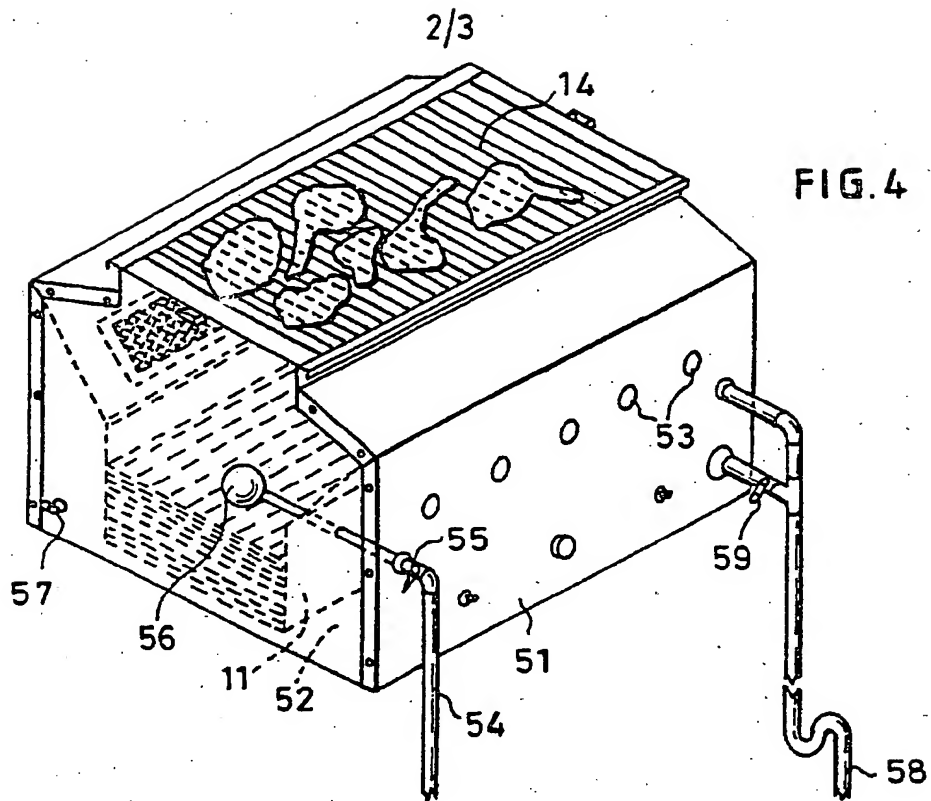


FIG. 3



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FIG. 6

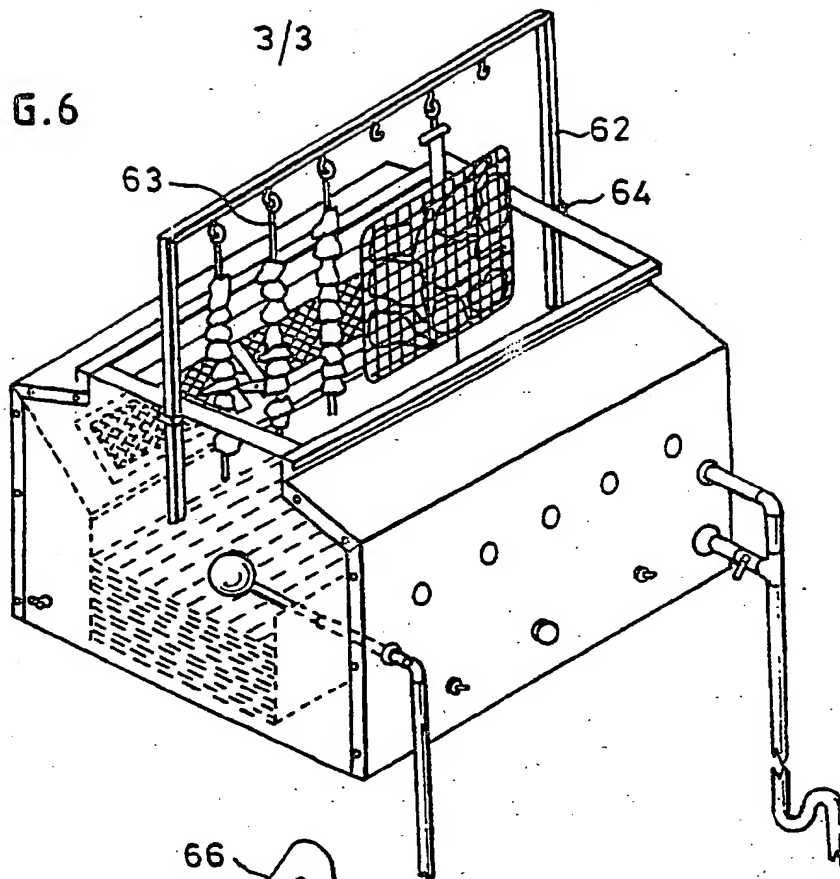
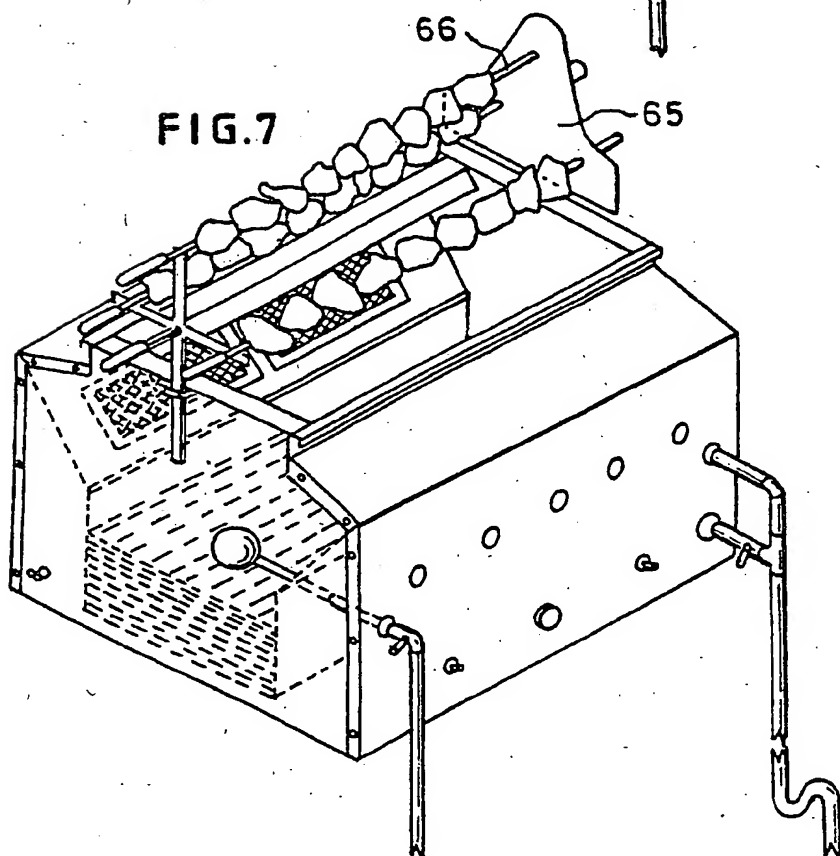


FIG. 7



GRILL

When food such as meat is heated, juices and other liquids emerge from it. If the food is heated from below, the heater should be displaced either side of the food position
5 so that the juices and other liquids do not fall on the heater. The heater displaced to the side of the food position needs a reflector to assist the transfer of heat to the food.

The present invention provides a grill of this type
10 comprising a chamber open at the top, means for supporting food at the top of the chamber, an upwardly directed radiation heating element within the chamber displaced to one side of the food support position, reflecting means above said element for reflecting heat radiated from the
15 heating element towards the general direction of the food support position, the reflecting means comprising a first portion extending generally in the direction from the heating element towards the food support position and a second portion extending generally transversely to that
20 direction into the path of radiation from the heating element to the food support position.

Preferably the first portion of the reflecting means stops short of the food support position and the second portion is located at the end of the first portion adjacent the
25 food support position. The second portion preferably includes an angle with the first portion of between 90° and 135°, preferably about 110°, said angle facing the heating element. The food supporting means, the heating means and the second portion of the reflecting means are preferably
30 constructed and arranged so that lines from the two ends of the heating means crossing at the free end of the second portion of the reflecting means subtend a distance across the food support position allocated to that heating element, all points across the food support position being

allocated to one and only one respective heating element. When heating elements are provided on two opposite sides of the chamber, the lines from one element preferably intersect the food support position at the midpoint and one side edge. This provides uniform heating for the food.

The bottom of the chamber is preferably provided with a water reservoir to act as a sump for liquids falling from the food being heated and this reservoir may be provided with a water supply and drain.

10 Examples of the invention will now be described with reference to the accompanying drawings in which

Figure 1 is a transverse section through a rectangular portable grill,

Figure 2 is a detail of a reflector for use with the apparatus of Figure 1,

Figure 3 is a radiation path diagram corresponding to Figure 1, and

Figures 4 to 7 show various embodiments of the invention in general terms, not showing all the features of Figure 1 in detail.

In Figure 1, the apparatus of the invention comprises a generally rectangular chamber 11 provided with a triangular side extension 12 on each of two opposite sides and an open top 13 covered by a grid 14 on which food to be cooked is supported. The base of the chamber 11 forms a water reservoir 15. The water in the reservoir 15 can be static, or it may be replenishable by means of a water inlet controlled by a ballcock valve (not shown in Figure 1) and a drain cock (also not shown in Figure 1).

30 In each side extension, there is a lower inclined wall 21 extending upwards and outwards at approximately 45° and an upper cover 22 extending downwards and outwards at about 60° to the vertical. On the lower wall, a radiant heater

device 23 is mounted arranged to direct its heat upwardly towards the grid. The heater can be provided with liquid fuel such as butane. The heater, located in the side extension, does not extend below the grid and so is not
5 affected by liquids and pieces of food dropping through the grid. It is protected from above by the cover 22.

In order to make the heating device more efficient, the cover is protected by a reflector 24 to reflect heat from the heating device away from the underside of the cover
10 towards the centre of the grill, in the general direction of the grid. The reflector, shown in more detail in Figure 2, has a first main portion 31 extending parallel to the cover from its end remote from the grid and extending about 70% of the length of the cover towards the grid. At the end
15 33 of the first portion adjacent the grid, the reflector is hinged through an angle of about 110° and has a second shorter portion 32 extending towards the centre of the chamber. As can be seen from Figure 2, the two portions 31 and 32 are joined by hinges 35. The angle between the
20 portions 31 and 32 can thereby be adjusted. The cover 22 continues towards the grid beyond the end 33 of the first reflector portion. From the upper end of the cover, the chamber continues vertically upwards at 35 to an outwardly turned rim on which the grid can be supported. It will be
25 seen that the free end 34 of the reflector is located vertically below the portion 35 of the chamber. Radiation directly reflected from the second portion 32 will be reflected back to the heater 23 without further reflection.

Referring to Figure 3, it will be seen that a line 41 from
30 the lower end of each heating device passing through the free end 34 of the second portion of the reflector passes through the grid adjacent its outer edge. Similarly, a line 42 from the upper end of the heating means passing through the free end 34 of the second portion of the
35 reflector passes through the grid at approximately its

midpoint. Assuming that the heating means provides heat uniformly across the angle between these two lines, then ignoring the difference in the lengths of the two lines, heat will be applied uniformly across the width of the grid
 5 by the heating means on the two sides of the chamber. Each point across the grid receives heat from one and only one heater element. If the second portion of the reflector were not present, more heat would reach the edge portions of the grid no longer protected by the missing second
 10 portion and heating of the food on the grid would not be uniform.

In Figure 4, the main chamber 11 is shown encased in an outer casing 51 depending from the outer edges of the extensions 12 and providing a surrounding air chamber 52
 15 with ventilation holes 53 in the outer casing which can therefore remain reasonably cool to the touch. The inner chamber is seen with its grid 14, side extensions 12, heating means 23 and water sump 15. The water sump is provided with a water inlet 54, an inlet valve 55
 20 controlled by a ballcock 56 and a drain cock 57 is also provided. A gas supply 58 to the heating means 57 is provided with a control valve 59. Figures 4 to 7 do not show the reflectors described above with reference to Figures 1 to 3 although they would be provided.

25 In Figure 5, the grid of Figure 4 is replaced by a kebab skewer frame 61 supported on either side of the top opening, the skewers supporting the food for cooking by the heating means. In Figure 6, a kebab frame 62 is mounted with the skewers 63 mounted vertically along the centre of
 30 the grill as a gallows frame supported from the ends of the top opening 13 at 64. In Figure 7, a kebab frame 65 is mounted from the ends of the top opening with the skewers 66 running longitudinally of the grill.

CLAIMS

1. A grill comprising a chamber open at the top, means for supporting food at the top of the chamber, an upwardly directed radiation heating element within the chamber
5 displaced to one side of the food support position, reflecting means above said element for reflecting heat radiated from the element in the general direction of the food support position, the reflecting means comprising a first portion extending generally in the direction from the
10 heating element towards the food support position and a second portion extending generally transversely to that direction into the path of radiation from the heating element to the food support position.

2. A grill as claimed in claim 1 wherein the first
15 portion of the reflecting means stops short of the food support position and the second portion is located at the end of the first portion adjacent the food support position.

3. A grill as claimed in claim 1 or claim 2 wherein the
20 two portions include an angle between 90° and 135° , said angle facing the heating element.

4. A grill as claimed in claim 3 wherein said angle is 110° .

5. A grill as claimed in any one of claims 1 to 4
25 wherein the food supporting means, the heating means and the second portion of the reflecting means are constructed and arranged so that lines from the two ends of the heating means crossing at the free end of the second portion of the reflecting means subtend a distance across the food support
30 means allocated to that heating element, all points across the food support position being allocated to one and only one respective heating element.

6. A grill as claimed in claim 5 and comprising a heating element and associated reflector on each of two opposite sides of the chamber, said lines from the elements intersecting the food support position at its midpoint and
5 a respective side edge.

7. A grill as claimed in any one of claims 1 to 6 wherein the portions of the reflector means are hinged together.

8. A grill as claimed in any one of claims 1 to 7
10 comprising a water bath at the base of the chamber.

9. A grill as claimed in any one of claims 1 to 8 comprising conduit means for supplying water to and draining water from the bath.

10. A grill as claimed in claim 9 wherein said conduit
15 means comprises means to maintain the water in the bath at a predetermined level.

11. A grill substantially as herein described with reference to the accompanying drawings.

Patents Act 1977

Examiner's report to the Comptroller under Section 17
(The Search report)

Application number
GB 9425213.7

Relevant Technical Fields

(i) UK Cl (Ed.N) A4D (D3, D9A, D10B1)

(ii) Int Cl (Ed.6) A47J 37/06, 37/07

Search Examiner
MR N A FRANKLIN

Date of completion of Search
25 APRIL 1995

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

Documents considered relevant following a search in respect of Claims :-
1-11

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	WO 81/03270 A1 (WHELAN) note reflector elements 14, 16 in Figure 2	1 at least
X	BR 8701598 A (DE ANDRADE) note reflector 23 in Figure 2; WPI Accession No 88-330408/47	1 at least

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).